

Appl. No. 10/064,605
Amdt. Dated July 29, 2004
Reply to Office action of: June 1, 2004

REMARKS/ARGUMENTS

In the office action dated June 1 2004, the examiner has rejected Claims 1, 2, 4-9 and 11-16. The June 1 Office Action has been carefully considered. After such consideration, Claims 1, 4, 7, 11, 15 and 16 have been amended. Claims 1-16 remain in this application and new claims 17-18 have been added. Applicant respectfully requests reconsideration of the application by the Examiner in light of the above amendments and the following remarks offered in response to the June 1 Office Action.

Objection to Specification

Applicant thanks the Examiner for pointing out the typing error in the paragraph numbers in the prior amendment. Applicant has resubmitted the amendment to the Specification with the proper paragraph numbers and respectfully requests that the objection be removed.

Prematureness of Final Rejection

Applicant submits that the final rejection on the present Office Action is premature. As stated in MPEP 706.07(a), "second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97 (c) with the fee set forth in 37 CFR 1.17(p)."

The rejections of claim 1 under Margiott and Wu and Margiott and Thonon are a new ground of rejection since Wu and Thonon were not cited as a ground for rejecting claim 3 or claim 10 in the prior rejection.

This rejection was not necessitated by Applicant's amendment of claim 1 to include the subject matter of claim 3 or by applicant's amendment of claim 7 to include the subject matter of claim 10. These amendments did not necessitate a new search or this new ground for rejection.

Rejections under 35 U. S. C 103 (a)

Claims 1, 2, 4-9 and 11-16 have been rejected as unpatentable over Margiott 2002/0086200 in view of Wu et al. 2002/0026999. Applicant respectfully traverses the rejection.

In the prior amendment, independent claims 1 and 7 were rewritten to include the subject matter of claims 3 and 10, respectively. In the present amendment, claims 1 and 7 have been re-amended to remove the added subject matter and be returned to their original scope. More specifically, claims 1 and 7 have been amended to eliminate the limitation that pluralities of concavities are disposed on a surface portion of said top channel and disposed on a surface portion of said bottom channel so as to cause hydrodynamic interactions and affect the heat transfer rate between said concavities when said fluid is disposed over said concavities.

Applicant respectfully submits that the applied references do not teach, suggest, or disclose (either individually or in combination) the claim recitations of 1 and 7.

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Margiott et al. does not teach, suggest, or disclose the claim 1 and 7 recitations of (with emphasis added):

1. (Currently amended) A cooling apparatus for fuel cell components comprising:
 - a base plate having a first end and a second end;
 - a first side plate coupled to said first end and a second side plate coupled to said second end;
 - a plurality of bottom ribs coupled to said base plate;**
 - a plurality of upper ribs coupled to said bottom ribs; and**
 - a top channel and a bottom channel formed between each of said plurality of upper ribs and each of said plurality of bottom ribs, respectively,**wherein said top channel and said bottom channel are **disposed to allow a flow of a fluid therethrough and disposed to allow a portion of said fluid to alternate between said top channel and said bottom channel** at a flow redirection area so as to enhance the heat transfer rate between said fluid and said fuel cell components.
7. (Currently amended) A fuel cell assembly comprising:
 - at least one fuel cell having at least two electrodes and an electrolyte disposed therebetween;
 - at least one cooling apparatus disposed over at least one of said electrodes, said cooling apparatus comprising:
 - a base plate having a first end and a second end;
 - a first side plate coupled to said first end and a second side plate coupled to said second end;
 - a plurality of bottom ribs coupled to said base plate;**
 - a plurality of upper ribs coupled to said bottom ribs; and**
 - a top channel and a bottom channel formed between each of said plurality of upper ribs and each of said plurality of bottom ribs, respectively,**
 - wherein said top channel and said bottom channel are **disposed to allow a flow of a fluid therethrough and disposed to allow a portion of said fluid to alternate between said top channel and said bottom channel** at a flow redirection area so as to enhance the heat transfer rate between said fluid and said fuel cell

The device described by Margiott et al. merely appears to describe a plurality of flow through reactant flow field channels and a plurality of interdigitated reactant flow field channels (claim 1). The fluid flow path is divided in a flow through reactant flow field and an interdigitated flow field wherein the fluid has to travel through the flow through reactant flow field before entering the interdigitated flow field. The ribs which form these flow channels are ribs 17 for the flow through channels and serpentine rib 20 for the interdigitated flow field (FIG. 2). These ribs are not shown or described as being in contact, do not form a top and bottom channel between themselves and are clearly not "disposed to allow a flow of a fluid therethrough and disposed to allow a portion of said fluid to alternate between said top channel and said bottom channel."

In contrast, the present application discloses the top channel disposed over the bottom channel, wherein the fluid is introduced in the top and the bottom channel simultaneously as can be most clearly seen by Fig. 1. The flow redirection area 170 exists at various locations of the cooling apparatus as the fluid, once introduced in the cooling apparatus alternately flows down to the bottom channel and flows up to the top channel. The upper rib and the bottom rib in the present application are disposed physically on top of each other, which is not disclosed or suggested by Margiott et al.

For these reasons, Applicant submits that claims 1 and 7 are allowable over Margiott and Wu regardless of Wu's description of a heat exchanger plate having a crimped turbuizier.

Claims 2, 4-6 depend directly or indirectly from claim 1 and Claims 8, 9 and 11-16 depend directly or indirectly from claim 7. Applicant respectfully submits that Claims 1 and 7 are patentably distinct from Margiott

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and Wu for the reasons discussed above and that claims 2, 4-6, 8, 9 and 11-16 are similarly allowable Margiott and Wu.

Claims 1, 2, 4-9 and 11-16 have been rejected as unpatentable over Margiott 2002/0086200 in view of Thonon et al. 5806584. Applicant respectfully traverses the rejection. For the reasons discussed above with respect to Margiott, Applicant submits that claims 1 and 7 are allowable over Margiott and Thonon regardless of Thonon's description of a heat exchanger plate.

Claims 2, 4-6 depend directly or indirectly from claim 1 and Claims 8, 9 and 11-16 depend directly or indirectly from claim 7. Applicant respectfully submits that Claims 1 and 7 are patentably distinct from Margiott and Thonon for the reasons discussed above and that claims 2, 4-6, 8, 9 and 11-16 are similarly allowable over Margiott and Thonon.

Accordingly, Applicant respectfully submits that the claimed invention defines allowable subject matter over the applied art. Withdrawal of the rejections is respectfully requested, and allowance of the claims is respectfully solicited.

Summary

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact applicant's undersigned representative at the telephone number below.

Respectfully submitted,

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